



**THE DATASHEET OF  
SI9706DY-T1**





## PC Card (PCMCIA) Interface Switch

### FEATURES

- Single SO-8 Package
- CMOS-Logic Compatible Inputs
- Slow  $V_{CC}$  Ramp Time
- Smart Switching
- Extremely Low  $R_{ON}$
- Reverse Blocking Switches
- Low Power Consumption
- Safe Power Up

### DESCRIPTION

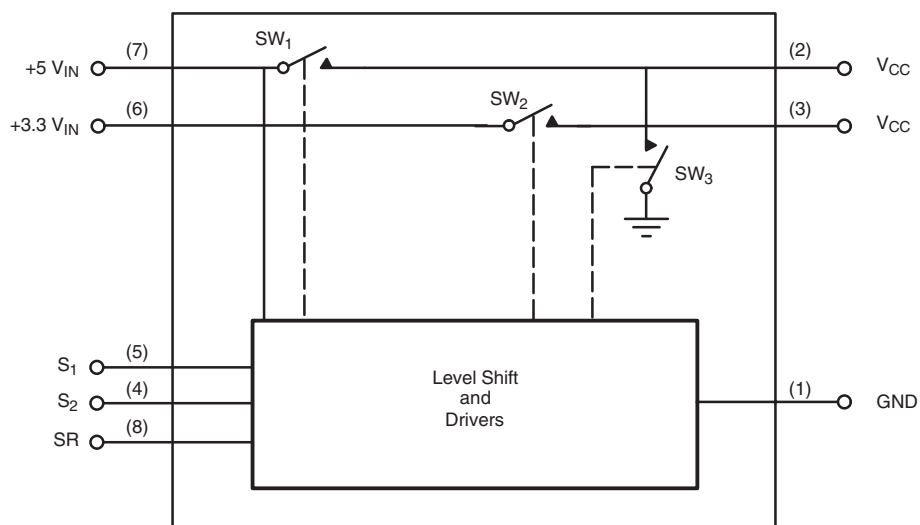
The Si9706DY offers an integrated solution for PC Card power interfaces that only require  $V_{CC}$  switching. This part is ideal for systems that operate at 5 V and provide  $V_{PP}$  from the main supply or from a dedicated Flash RAM 12-V supply.

The Si9706DY operates off the 5-V supply and has built-in level shifting for gate drive. Internal logic protects against a control logic error that would short 5 V to the 3.3-V supply. This protection logic also allows the Si9706DY to be configured for

positive or negative control logic for compatibility with a variety of PC Card controllers. These control inputs are CMOS logic compatible and can be driven to 3.3 V or 5 V.

The Si9706DY PC Card interface switch is packaged in a narrow body SO-8 package and is rated over the industrial temperature range  $-40$  to  $85^{\circ}\text{C}$ . The Si9706DY is available in lead free.

### FUNCTIONAL BLOCK DIAGRAM





### ABSOLUTE MAXIMUM RATINGS

Voltages Referenced to Ground	
+5 V <sub>IN</sub> .....	7 V
+3.3 V <sub>IN</sub> .....	7 V
S <sub>1</sub> , S <sub>2</sub> (CMOS Inputs) .....	7 V
All Pins .....	-0.5 V
I <sub>OUT</sub> V <sub>CC</sub> <sup>a</sup> .....	4 A

PD Max <sup>b</sup> : (T <sub>A</sub> = 25°C) .....	1.59 W
(T <sub>A</sub> = 85°C) .....	0.63 W
Junction Temperature .....	125°C
Thermal Ratings <sup>b</sup> : R <sub>θJA</sub> .....	63 °C/W

#### Notes

- Pins 2, 3 connected together externally.
- Mounted on 1-IN<sup>2</sup>, FR4 PC Board.

### RECOMMENDED OPERATING CONDITIONS

+5 V <sub>IN</sub> (must be present) .....	5 V ± 10%
+3.3 V <sub>IN</sub> .....	3.3 V ± 10%
C <sub>SR</sub> .....	33 nF
I <sub>OUT</sub> V <sub>CC</sub> <sup>a</sup> .....	2 A

V <sub>CC</sub> Load Capacitance .....	150 μF Max
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#### Notes

- Pins 2, 3 connected together externally.

SPECIFICATIONS							
Parameter	Symbol	Test Conditions Unless Otherwise Specified C <sub>SR</sub> = 33 nF, +5 V <sub>IN</sub> = 5 V +3.3 V <sub>IN</sub> = 3.3 V, Low ≤ 0.8 V, High ≥ 2.2 V		Limits			Unit
				Min <sup>a</sup>	Typ <sup>b</sup>	Max <sup>a</sup>	
<b>Switch SW<sub>1</sub></b>							
On-Resistance	R <sub>ON</sub>	I = 500 mA, S <sub>1</sub> = High S <sub>2</sub> = Low	T <sub>A</sub> = 25°C	58	70	mΩ	
			T <sub>A</sub> = 85°C	73	90		
Off Current (V <sub>CC</sub> )	I <sub>OFF</sub>	+5 V <sub>IN</sub> = 5.5 V, V <sub>CC</sub> = 0 V S <sub>1</sub> = S <sub>2</sub> = Low	T <sub>A</sub> = 25°C		1	μA	
			T <sub>A</sub> = 85°C		10		
Rise Time	t <sub>S1(on)</sub>	S <sub>2</sub> = Low, See Figure 1		0.2	1.7	ms	
Fall Time	t <sub>S1(off)</sub>			10	30		50
<b>Switch SW<sub>2</sub></b>							
On-Resistance	R <sub>ON</sub>	I = 500 mA, S <sub>2</sub> = High S <sub>1</sub> = Low	T <sub>A</sub> = 25°C	44	55	mΩ	
			T <sub>A</sub> = 85°C	55	70		
Off Current (+3.3 V <sub>IN</sub> )	I <sub>OFF</sub>	+3.3 V <sub>IN</sub> = 3.6 V, V <sub>CC</sub> = 0 V S <sub>1</sub> = S <sub>2</sub> = Low	T <sub>A</sub> = 25°C		1	μA	
			T <sub>A</sub> = 85°C		10		
Rise Time	t <sub>S2(on)</sub>	S <sub>1</sub> = Low, See Figure 1		0.1	0.9	ms	
Fall Time	t <sub>S2(off)</sub>			5	20		40
<b>Switch SW<sub>3</sub></b>							
On-Resistance	R <sub>ON</sub>	I = 2 mA, S <sub>1</sub> = S <sub>2</sub> = Low	T <sub>A</sub> = 25°C	140	400	Ω	
			T <sub>A</sub> = 85°C	200	500		
<b>Power Supply</b>							
+5 V <sub>IN</sub> Current Input (on)	I <sub>+5VIN(1)</sub>	S <sub>1</sub> = 0 V, S <sub>2</sub> = 3 V		20	50	μA	
	I <sub>+5VIN(2)</sub>	S <sub>1</sub> = 3 V, S <sub>2</sub> = 0 V		20	50		
+5 V <sub>IN</sub> Current Input (off)	I <sub>+5VIN(3)</sub>	S <sub>1</sub> = S <sub>2</sub> = 0 V		< 1	10		
Input Voltage High	V <sub>I(H)</sub>	+5 V <sub>IN</sub> = 5.5 V	2.2	1.8	V		
		+5 V <sub>IN</sub> = 4.5 V	2.2	1.6			
Input Voltage Low	V <sub>I(L)</sub>	+5 V <sub>IN</sub> = 5.5 V		1.6	0.8		
		+5 V <sub>IN</sub> = 4.5 V		1.4	0.8		
Input Current High	I <sub>I(H)</sub>	S <sub>1</sub> , S <sub>2</sub> = 5 V			1.0	μA	
Input Current Low	I <sub>I(L)</sub>	S <sub>1</sub> , S <sub>2</sub> = GND	-1.0				

#### Notes

- The algebraic convention whereby the most negative value is a minimum and the most positive a maximum.
- Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.

### TIMING WAVEFORMS

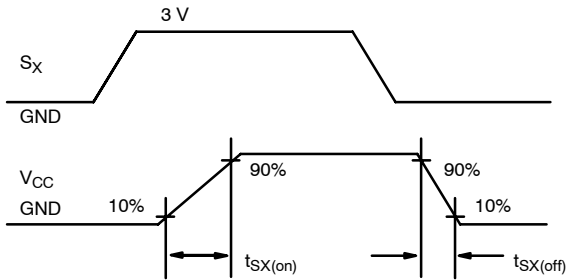


FIGURE 1. Switch Ramp

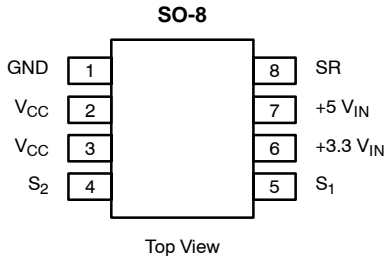
### TRUTH TABLE

$S_1$	$S_2$	Switch 1	Switch 2	Switch 3
0	0	Off	Off	On
0	1	Off	On	Off
1	0	On	Off	Off
1	1	Off	Off	On

#### Notes

- a. The smart switching of the Si9706DY avoids potential host damage by defaulting to off during error conditions.

### PIN CONFIGURATION AND DESCRIPTION

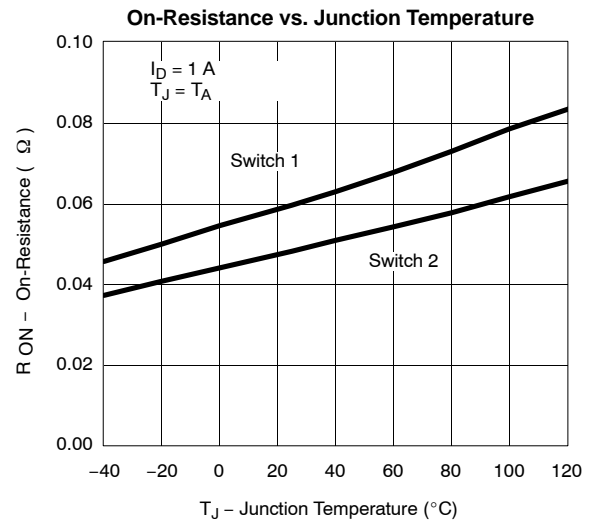
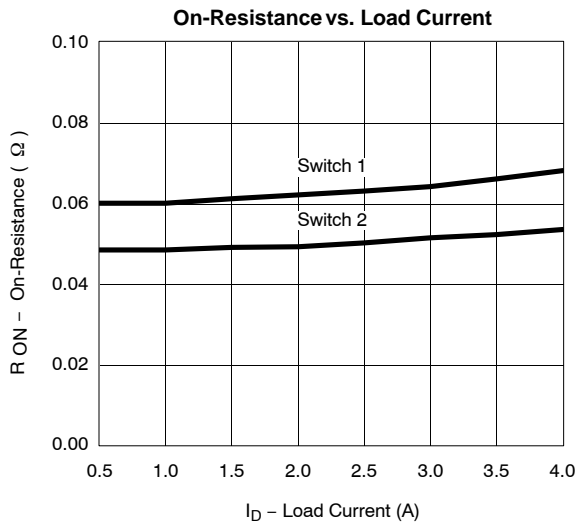


Pin	Function	Description
1	GND	Ground connection.
2, 3	$V_{CC}$	Supply voltage to slot.
4	$S_2$	Control input for selecting $+3.3 V_{IN}$ to $V_{CC}$ .
5	$S_1$	Control input for selecting $+5 V_{IN}$ to $V_{CC}$ .
6	$+3.3 V_{IN}$	$+3.3$ -V supply.
7	$+5 V_{IN}$	$+5$ -V supply.
8	SR	Slew rate control pin.

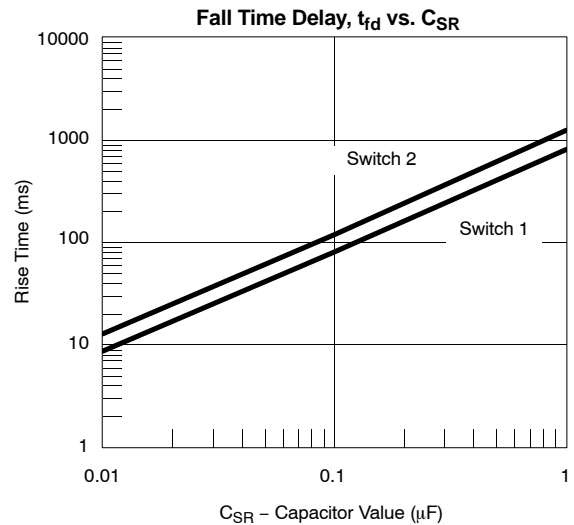
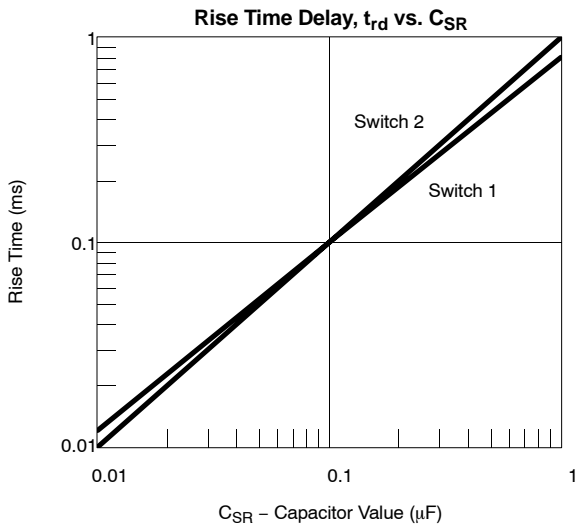
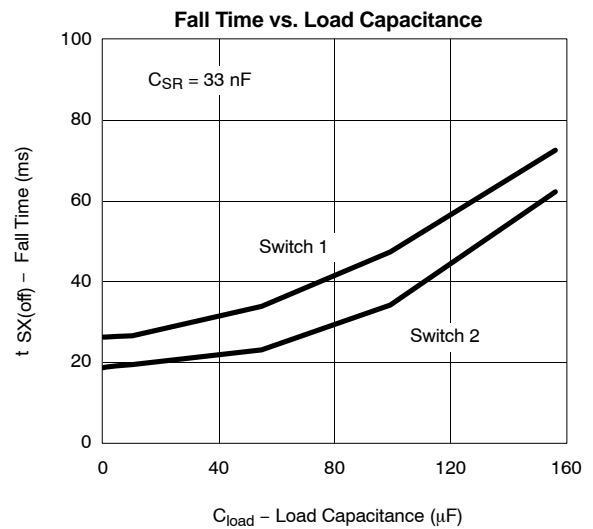
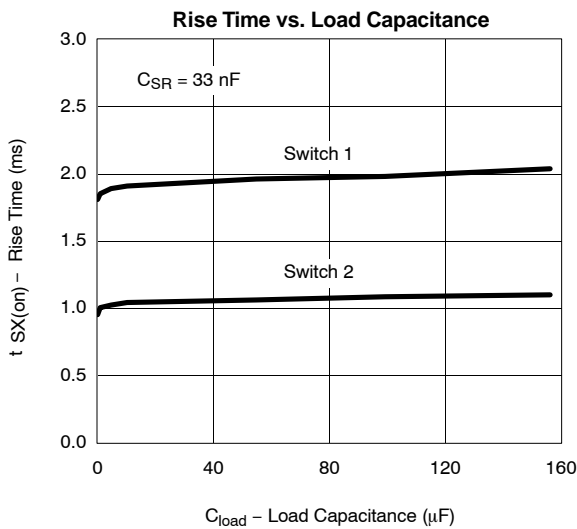
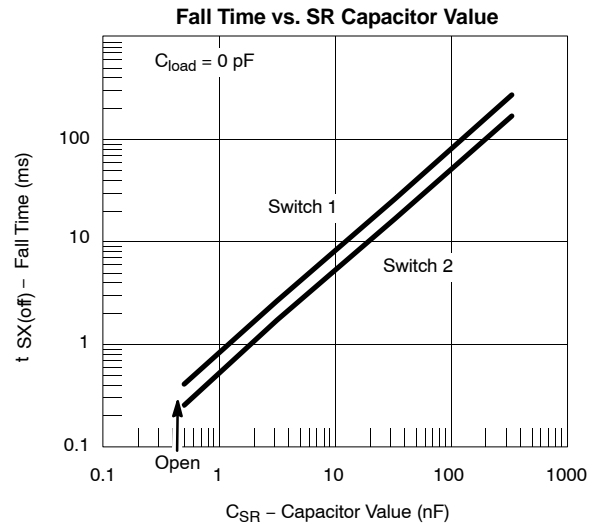
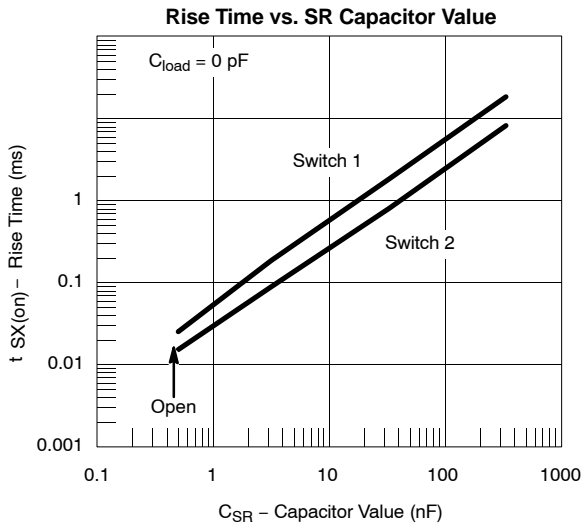
### ORDERING INFORMATION

Part Number	Temperature Range
Si9706DY-T1	-40 to 85°C
Si9706DY-T1-E3 (Lead Free)	

### TYPICAL CHARACTERISTICS (25°C UNLESS OTHERWISE NOTED)



**TYPICAL CHARACTERISTICS (25 °C UNLESS OTHERWISE NOTED)**



## SOIC (NARROW): 8-LEAD

JEDEC Part Number: MS-012



DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A <sub>1</sub>	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026
ECN: C-06527-Rev. I, 11-Sep-06				
DWG: 5498				



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